

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

**CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE
PORTLAND, OREGON**

November 6, 2002

TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>

DRAFT

FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Donna Silverberg

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Burbot SOR:

BPA offered a proposal for Libby operations based on weather forecast modeling. The proposal can be found on the TMT web site. Scott Bettin, BPA, explained that if VARQ is implemented and temperatures remain normal for the month of December, there is a higher likelihood that the burbot SOR will be implemented. BPA's suggestion is to maximize the value of the available water since power prices are higher in December than November, by increasing Libby discharges the first three weeks in December and reducing discharges to about 10.6 kcfs the last week in December. The SOR requested 4 – 10.6 kcfs the last two weeks in December and for the entire month of January. Dave Wills, USFWS, would like the burbot group to look at the proposal and make suggestions based on their technical expertise.

ACTION: The burbot group will look at the proposal and comment on it at the next TMT meeting, November 13.

Chum Operations Update:

During a conference call last Friday, TMT was informed that no chum had been sited. The group then agreed to begin the chum operation on Tuesday at 7 am (yesterday). Cathy Hlebechuk said that the COE will continue to make best efforts to target the requested elevations for this operation. Paul Wagner, NMFS, reported that during a site visit yesterday five chum and two redds were observed. Available habitat was low due to dry conditions. FPAC requested an increase to 11.5' tailwater elevation. The final operating decision was made to target 11.3' with an operating range of 11.1-11.5' until there is more rain in the Hamilton and Hardy Creek area.

Oregon expressed concern that the operation was at a lower range than previous years. Others expressed concerns for conditions to remain stable. USFWS expressed a preference for 11.5' elevation but was willing to accept the 11.3' operation, given that NMFS was comfortable with the operation. NMFS said that the operation is consistent with the Biological Opinion.

ACTION: A conference call will be held on Friday at 3 pm to assess conditions and discuss the chum operation. The call-in number is 503-808-5190. (NOTE: A summary of Friday's discussion will be available on the TMT website.)

WMP Fall/Winter Update:

NMFS handed out suggested changes to chum, burbot, and flood control operations in the Fall/Winter update. Suggestions were made to add Vernita Bar, current hydrology and early season forecasts to the update. Oregon suggested that storage levels could also be included to aid in chum discussions.

Hydro Alternatives Process Update:

Suzanne Cooper, BPA, gave a presentation and showed a "map" of the regional forum processes that show where and how decisions will be made on hydro alternatives to the Implementation Plan. TMT members requested clarification on the Executive Committee – its function and who its members are. Some TMT members expressed interest in reinvigorating the Executive Committee involving the public with this group.

ACTION: IT members will discuss the issues raised by TMT members at the IT meeting on Thursday, November 7. Issues will focus on IT guidelines and the Executive Committee's role in the Regional Forum.

TMT suggested a few changes to the "map", including clarifying that FFDRWG and SRWG are regional coordination rather than regional forum processes, and adding an "advisory" line from FFDRWG to TMT.

Year End Review:

The main purpose of today's meeting was to give TMT members a chance to reflect on the past year and discuss the various events and decisions that affected the regional hydro system.

Report on Snake River Operations:

Tony Norris, BOR, distributed a handout on the water that the BOR provided in 2002, the start date for releases, and other operations including Idaho Power's Brownlee operation and the Cascade operation. In summary, there was not a lot of water available to provide above Milner Dam except 24 kaf that Idaho Power provided.

Dworshak Operations:

Chris Perry, University of Idaho, was not available today but will present his information at a future TMT meeting.

TDG Exceedances:

Laura Hamilton, COE, gave a review of the 2002 spill program. There was lower TDG compliance (82.3%) than previous years due to water quality issues including spillway

deflectors, new spill patterns, and other natural conditions that were out of the operators' control. Oregon pointed out that on the other side of the issue, there were some problems with not meeting spill and not reaching the spill cap. This issue will be continued at the next TMT meeting. The WQT could also be involved in these discussions.

Fall Chinook Survival in the Snake River:

Billy Connor, Idaho Fish and Game, presented a study on summer flow augmentation and effects on fish survival in the Snake River. Survival rates seem to correlate with flow augmentation and low temperatures. Billy offered to present flow augmentation and survival for 2002 at a future TMT meeting. Jim Ruff, NMFS, requested that the future presentation compare scenarios of extending or not extending flow augmentation further into the season. Augmentation shifts are assessed through modeling. During a presentation next spring, shifts will also be assessed through comparison to previous years. It was clarified that the data presented today is for the Snake River down to Lower Granite. A document that describes the study in more detail was handed out at the end of the presentation.

Hanford Reach Juvenile Stranding:

Paul Hoffarth, WDFW, presented a study on 2002 river temperatures and Chinook emergence. The study showed that: juveniles have a lower susceptibility to entrapment if they are 60 mm or bigger; entrapment areas tend to be at lower flow elevations; a decrease in discharge during nighttime hours tends to increase stranding; and fluctuating water levels severely limits structure, density and biomass of macroinvertebrates. Overall, Paul's assessment was that 2002 was a fairly successful year with low stranding rates.

Performance Standards:

Paul Wagner, NMFS, presented juvenile in-river survival rates for 2002. Survival rates were much higher than 2001, although it was noted that 95% of fish were transported in a barge that year. Further information will be provided during subsequent TMT meetings. Paul will send the information to Cathy Hlebechuk to post on the TMT website.

Fish Migration:

Chris Ross, NMFS, showed migration patterns for 2002. He also pointed out some weather or other emergency situations and commended the action agencies for responding quickly and successfully helping the fish. He noted that other fish migration studies are coming out.

Weather Review:

Kyle Martin, CRITFC, presented a review of 2002 weather patterns and forecasted weather for 2003. Overall, he reported that 2002 saw the end of a drought, normal precipitation and some record-breaking summer temperatures. Kyle's 2003 forecast shows near-normal conditions.

Chum:

Shane Scott, Washington, presented chum figures from 2002. The group will continue to use this and other data to make operational decisions about chum.

Next Meeting:

TMT will have a conference call on Friday to discuss chum operations. The call will begin at 3 pm and the number is 503-808-5190.

The next face to face meeting will be held on **Wednesday, December 4**. Topics include:

- Burbot operations
- Chum operations
- Spill Cap Continuing Discussions – Oregon

Meeting Minutes

1. Greeting and Introductions

The November 6 Technical Management Team year-end review meeting was chaired by Cathy Hlebechuk of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3936.

2. Burbot SOR.

[These burbot notes are from Robin Harkless, facilitator contractor as our normal notetaker arrived late at the meeting.]

BPA offered a proposal for Libby operations based on weather forecast modeling. The proposal can be found on the TMT web site. Scott Bettin, BPA, explained that if VARQ is implemented and temperatures remain normal for the month of December, there is a higher likelihood that the burbot SOR will be implemented. BPA's suggestion is to maximize the value of the available water since power prices are higher in December than November, by increasing Libby discharges the first three weeks in December and reducing discharges to about 10.6 kcfs the last week in December. The SOR requested 4 – 10.6 kcfs the last two weeks in December and for the entire month of January. Dave Wills, USFWS, would like the burbot group to look at the proposal and make suggestions based on their technical expertise. Discussion will take place on November 13.

3. Chum Operations Update.

Hlebechuk began this agenda item by reporting that, at last Friday's field survey, field crews saw no chum on the spawning grounds. You will recall that we were targeting November 5 for the start of the chum operation, and went to a hard Bonneville tailwater constraint of no lower than 10.8 feet as of Tuesday morning, November 5, Hlebechuk said; that is the current operation in place from 7 a.m. to 7 p.m. Paul Wagner said that, during yesterday's site visit, five adult chum and two redds were observed in the Ives/Pierce Island area. He noted that the 11-foot tailwater at Bonneville is supposed to equate to a Bonneville outflow of 125 Kcfs; based on yesterday's site visit, that looks to be a bit on the low side, he said. Field crews feel that tailwater elevation is on the low side of marginal, from a habitat availability standpoint; therefore, NMFS is requesting an 11.5-foot minimum tailwater elevation at Bonneville, Wagner said.

Because chum are now on the spawning grounds, the action agencies have agreed to go to a Bonneville tailwater operating range of 11.1-11.5 feet, targeting 11.3 feet, Hlebechuk

replied. Scott Bettin added that Hamilton and Hardy Creek are supposed to receive about two inches of rain by this weekend, and should start flowing more strongly.

Ron Boyce expressed his displeasure that tailwater elevations have been so low – traditionally, we have started the chum operation with a Bonneville tailwater elevation of 11.5 feet, he said. I don't understand what's changed this year, said Boyce – you have a lot of water in storage, so what's the problem? Bettin and Tony Norris replied that the Spokane and Colville Tribes are requesting that an elevation of 1283 feet be maintained at Grand Coulee through mid-November. It seems to me that you could maintain 11.5 feet in the Bonneville tailwater, the historic operating range once chum start to arrive on the spawning grounds, and still keep Grand Coulee above 1283 through mid-month, Boyce said. I would remind you that field crews saw no chum at Ives/Pierce Island on Friday, and only five fish yesterday, Bettin said – the fish are just beginning to arrive now. Our concern is balancing the chum operation and storage needs, he said.

We need to make a decision on this today, Boyce said. We're proposing to target 11.3 feet, Bettin replied. Why not target 11.3-11.7 feet? Boyce asked. Once flows in the river come up, that will be possible, said Bettin. We could go back to the Biological Opinion flow of 125 Kcfs, he said; again, we're concerned about using too much storage at this time. Wagner noted that the dry conditions over the past several months have depleted the groundwater that would normally help keep the Bonneville tailwater elevation up; he said that in past years, the current Bonneville discharge of 126.6 Kcfs would have produced the 11.5-foot tailwater elevation the salmon managers are seeking, rather than the 11 feet we're seeing currently.

There is no guarantee that the rain will fall and the fish will be able to access Hamilton Springs and Hardy Creek, said Boyce. There is spawning habitat in the mainstem, which the fish can access if you keep the tailwater elevation high enough, he said. Actually, we are going to see a nice, steady rain through next week, Kyle Martin said. CRITFC does love chum, he added, as long as Bonneville discharge doesn't exceed 125 Kcfs at this point in the season. And the action agencies have said that as soon as the rains begin and flows come up in the mainstem, they are willing to maintain the 11.5-foot Bonneville tailwater elevation you're requesting, said Silverberg.

We have heard that, from a technical standpoint, a steady 11.5-foot tailwater elevation would be best for fish, Silverberg said; we have heard also that the action agencies will maintain 11.1-11.5 feet as the tailwater range at Bonneville until precipitation and mainstem flows increase. In response to a question from Boyce, Hlebechuk said it would take an additional 5 Kcfs outflow from Grand Coulee to provide the requested 11.5-foot tailwater elevation at Bonneville. That equates to a foot of storage per week at Grand Coulee, Bettin said.

Wagner reminded the group that the current 2003 runoff forecast is far from rosy; at Dworshak; for example, they are predicting a 2 MAF water supply, which compares to a historic average runoff of 2.5 MAF in that basin. For that reason, he said, NMFS favors a more conservative approach to the chum operation this year. Starting at 125 Kcfs outflow from Bonneville, then gradually increasing it as flows come up naturally, is not inconsistent with the BiOp, Wagner said. After a few minutes of further discussion, David Wills said that, while he does not agree with the current operation, he is reluctant to push this issue further. It was agreed to hold further discussion of the chum operation at a TMT conference call at 3 p.m. Friday,

November 8; in the interim, the action agencies will operate to a Bonneville tailwater elevation of 11.0-11.5 feet. .

4. Comments on WMP Fall/Winter Update.

Are there any additional comments on the fall/winter update today? Silverberg asked. Wagner provided some NMFS comments, in particular, on the “Chum Spawning Flows,” “Burbot Spawning Flows” and “Flood Control” sections of the update. He spent a few minutes going through these comments, noting that NMFS will also be providing comments on the currently proposed Vernita Bar operation. It would also be nice to add a section about current hydrology and early runoff forecasts, Wagner said – we do have an early Southern Oscillation Index forecast for Dworshak and Libby, for example, and it would be helpful to have a few words about the current thinking about what kind of water year it’s going to be. That section should also include information about current reservoir storage, said Boyce.

What is the timeline for providing comments on the Water Management Plan? Boyce asked. Today, Hlebechuk replied – we wanted to finalize this document by the end of October. Boyce said he will provide a few additional Oregon comments as soon as possible.

5. Hydro Alternatives Process Update.

At the last TMT meeting, said Silverberg, there were a number of questions about the process for making changes to the BiOp; we wanted to get a report today on that topic. Bonneville’s Suzanne Cooper distributed a schematic showing how, under the current Regional Forum process, information and issues relating to Biological Opinion implementation are to be discussed and resolved. She also touched on the various hydrosystem alternatives the action agencies are considering, and how that decision process is expected to flow through the NMFS Regional Forum groups. Cooper spent a few minutes going through this information, noting that chum flows and Spring Creek spill, for example, will be addressed within TMT.

Cooper also went through the current dispute resolution language in the Regional Forum guidelines, noting that, for the purposes of this document, “consensus” is defined as a lack of strong objection. Issues on which consensus cannot be achieved can be elevated to the IT; if the IT cannot reach consensus, the operating agencies with the authority to make the decision will decide in-season management issues. Non-in-season management issues can be elevated to the Executive Committee.

Silverberg noted that the Regional Forum guidelines will be discussed in detail at tomorrow’s Implementation Team meeting. The group devoted a few minutes of discussion to the viability of the Executive Committee, given the fact that this group, as originally constituted, has not met for several years. Richelle Harding commented that, if it is re-constituted, the Executive Committee’s meetings need to be open and accessible to the public. Silverberg added that, as soon as the Regional Forum guidelines are finalized, they will be brought back to the TMT for further discussion.

So this is essentially the existing process? Jim Litchfield asked. That’s correct, said Cooper – at the last TMT meeting, there was a fair amount of confusion about how decisions that modify the 2000 BiOp are to be made. The intent was simply to lay out the existing process and to make sure they were clear, she said. In response to a question, Jim Ruff explained that this is

also related to the implementation planning process; the action agencies submit their annual implementation plans to NMFS, which then reviews what is proposed for consistency with the BiOp RPAs. NMFS will then issue annual findings letters which will memorialize any changes to the hydro actions in the BiOp, he said. Cooper added that both the annual implementation plans and the water management plans are issued in draft form for public review and comment. And is last year's findings letter available? Wills asked. Yes – from the <http://www.nwr.noaa.gov> website, Ruff replied.

6. Year-End Review.

A. Report on Snake River Operations. Norris provided a handout detailing the water provided by Reclamation from the Upper Snake River in 2002: a total of 288.8 kaf, which includes the 40 kaf in Cascade Reservoir storage credited to this year. Releases began May 6, he said. One question is whether the Upper Snake water ever made it out of Brownlee, he said; the short answer is that yes, Idaho Power did pass the required amount of water through, based on an analysis of actual inflow and outflow at that project. The bottom line is that we didn't have a lot of water to provide in 2002, despite the fact that, as this handout shows, Reclamation does its utmost to pursue every available kaf of water, Norris said, adding that Idaho Power actually provided 24 kaf of their own power head water at Reclamation's request.

B. Dworshak Operations. Wagner said Chris Perry will provide this presentation at a future TMT meeting, once he has a chance to fully analyze the data from 2002.

C. TDG Level Variations. Laura Hamilton said this topic is probably too lengthy to address at today's meeting; she said her plan for today was to review the 2002 spill program only. She provided a handout, available via the TMT website, detailing the days of exceedance of the TDG standard at the Corps' Columbia and Snake River projects and at Dworshak. In 2002, there were 490 exceedances out of 2,760 spill-days at the Columbia and Snake River projects; at Dworshak, there were 262 hours of exceedance out of a total of 3,312 hours of spill. That translates into an 82.3% rate of compliance at the Columbia and Snake River projects, down from 90.3% compliance in 2002. At Dworshak, the compliance rate was 92% in 2002. Obviously, she said, we didn't do as well this year.

Ruff noted that there were reasons for this increase in exceedances in 2002, including problems with the fixed monitoring sites, some of which registered exceedances even on days when no spill was occurring. We have also installed new flow deflectors at a number of projects, said Ruff, and are still fine-tuning operations to see what spill volumes and patterns are optimal. Hamilton agreed, noting that there were many instances when exceedances occurred for reasons beyond the action agencies' control, including unit and Intertie outages.

Boyce noted that, in addition to the increased number of exceedances in 2002, there were other problems this year -- particularly the fact that, when exceedances occurred, the action agencies would reduce spill volumes and keep them well below the volumes needed to meet the 120%/115% standards for several days. I do have a presentation that will address that concern, explaining how those decisions are made in real-time, Hamilton said; however, it is too lengthy for today's meeting. It was agreed that Hamilton's presentation will be made at the November 20 TMT meeting.

D. Fall Chinook Survival in Snake River. Billy Connor provided a presentation titled “Does Summer Flow Augmentation Increase Survival of Young Fall Chinook Salmon?” The full text of this presentation is available directly from Connor at william_connor@fws.gov. He touched on the following major topic areas:

- What is summer flow augmentation?
- Lower Granite Reservoir flow and temperature with and without flow augmentation (graph)
- Underlying beliefs about summer flow augmentation
- The disconnect between policy and science
- Why ignore all of the data on wild fall chinook salmon?
- Detection and sampling stations on the Snake and Columbia Rivers (map)
- Flows vs. detection rates at Lower Granite Dam, 1998 (graph) – as flow increases, so does detection rate
- Water temperature vs. detection rates at Lower Granite Dam, 1998 (graph) – as temperature increases, detection rate decreases
- Survival analyses with 1998-2000 data – estimated survival from release to the tailrace of Lower Granite Dam on a “cohort” basis
- Factors on a cohort basis
- How flow and temperature exposure indices were calculated in this study (box plots)
- The final model
- Survival vs. flow and temperature (graphs)
- Survival is predicted to increase as flow increases and decrease as temperature increases
- Recalculating flow and temperature exposure indices for survival analyses (box plots)
- Estimated total decreases in survival, by cohort, without augmentation (range: 12.1% to 19.2%)
- Conclusions

What biological effects did you observe from the September flow augmentation releases this year? Bettin asked. I'll have to get back to you on that, Connor replied – we did radio-tag some fish this year, so we will have some good data. Can you do a “with flow augmentation” and a “without” analysis on that? Ruff asked. Yes, Connor replied. Have you done a similar analysis for spring flow augmentation? Hlebechuk asked. I've never studied that, personally, Connor replied; it has been studied in detail by other folks. And what's the time frame for the post-August 31 analysis? Boyce asked. Probably early spring, Connor replied.

Where was survival measured? Jim Litchfield asked. From the release points to below Lower Granite Dam, Connor replied – that's as far down the system as I've gone, at this point. Chris Ross said NMFS has studied survival and travel time for Lyons Ferry fish to below Lower Monumental, but that's as far down as they've gone for Snake River fall chinook. There is other data available for Hanford Reach fall chinook in the Columbia, Ross said – give me a call. Ross added that NMFS had used Connor's model to predict survival in 2001, and the results were extremely close to actual survivals. We have a great deal of confidence in the model, he said.

Any new information on the necessary outmigration size for the Clearwater fall chinook? Wagner asked – it seems like we have that debate with the Nez Perce every year. At about 60 mm, they shift habitat from the littoral zone to the deeper part of the river and get flushed down into the reservoir, Connor replied. However, I don't subscribe

to the theory that there is a magic size at which those fish are ready to actively migrate, he added.

Any advice for us, as water managers, in terms of what we've done to date? Boyce asked. I think you do the best you can do in a very complicated situation, Connor replied – you're juggling a lot of balls simultaneously. Once we complete the analysis of the 2002 data, I might be able to be a bit more helpful, Connor added.

E. Hanford Reach Juvenile Stranding. Paul Hoffarth of WDFW led this presentation, titled "2002 Evaluation of Fall Chinook Stranding on the Hanford Reach." This is the sixth year of this study, Hoffarth said, noting that Grant PUD provided both funding and field personnel for the 2002 study. He touched on the following major topics:

- The current and previous study areas in the Hanford Reach (map)
- The location of the 2002 index sites
- 2002 river temperature and chinook emergence (graph) – Emergence started March 17; emergence ended April 25, and the Hanford Reach juvenile fall chinook protection program started on March 21 and ended June 4 (at 400 TUs beyond the start of emergence). The last entrapped fish was found on June 9. The random sampling program ended June 15.
- Length-frequency of stranded/entrapped fall chinook in random samples, 1999-2002 (graph) – typically, entrapment ends when average fork length reaches about 60 mm, Hoffarth said.
- Average fork length and relative abundance of juvenile fall chinook salmon, index sampling 2000, 2001 and 2002 (graph)
- A description of the 2002 protection plan
- Area of shoreline exposed within each 10 Kcfs flow band (graph)
- Monthly average discharges from Priest Rapids Dam, 1991-2002 (table)
- Daily fluctuations from Priest Rapids Dam, 2000, 2001, 2002, by period (tables)
- Hourly discharge and daily average flows at Priest Rapids Dam, March 1-June 30, 2002 (graph)
- Weekly numbers of juvenile fall chinook found in random plots in the Hanford Reach, 2002 (only 188 total chinook at reach for the entire period of March 17-June 15). Hoffarth noted that most of the mortalities occurred early in the season, when flows were low.
- Results from the 1999, 2000, 2001 and 2002 field seasons – the bottom line, said Hoffarth, is that, in the study area, we estimate that only about 110,000 chinook mortalities occurred in 2002, compared with 4.8 million in 2001 and 457,000 in 2000.

In closing, Hoffarth offered the following summary points:

- Start of emergence typically occurs in March and coincides with low flows
- End of emergence corresponds with peak abundance and length-frequency
- What we think we know: that decreases in discharge during hours of darkness are more likely to result in stranding and entrapment.

In response to a question from Litchfield, Hoffarth said the yearly Hanford Reach fish protection operation is revised following a daylong review of the 2002 field season, which typically occurs in January or February. Have you looked at all at the delayed mortality effects of stranding? Boyce asked. We haven't looked at cumulative effects in detail, Hoffarth replied, although we have done some temperature tolerance testing. We didn't see much of an effect, in terms of delayed mortality, following our temperature tolerance testing, he said.

F. History of Spawning Corresponding to Vernita Bar Levels. Hoffarth also provided information on critical flow and elevation levels at Vernita Bar, with respect to optimal spawning conditions. He shared data on Vernita Bar spawning covering the period 1988-2002. In recent years (since 1993), the critical elevation has been set at 50 Kcfs, 60 Kcfs or 65 Kcfs; in 2001, it was 50 Kcfs. The critical elevation level has not yet been set for 2002, but if it was set now, it would likely be at 65 Kcfs, Hoffarth said. It looks like adult fall chinook escapement in the reach will be approximately 80,000 this year, with roughly double the emergence seen in 2002, Hoffarth added.

G. Migration Status. Chris Ross provided a graph showing Lower Granite outflow over time during the spring period, noting that the onset of the freshet was very late in 2002. Another graph charted the response of the juvenile outmigrants, in terms of the number of ESU (wild Snake River spring/summer chinook, steelhead and sockeye) PIT-tag detections at Lower Granite, from late March to mid-June, 2002. In general, all three ESU groups responded strongly to the onset of the freshet. For the run at large, the response was similar, Ross said – detections increased significantly following the peaks in flow. He added that there was a particularly strong response to the brief operation in which Lower Granite ponded water during the day, then discharged up to 100 Kcfs during nighttime hours – that tells me that there are a lot of fish holding close to the project, Ross said.

Moving on to summer juvenile migration data, Ross said the wild Snake River fall chinook detections at Lower Granite showed four distinct peaks during July and early August. At McNary, the peak of the migration occurred during the first week in May. With respect to steelhead detections at McNary, Ross said that if they didn't make it by the second week in June, they didn't make it at all. Mid-Columbia steelhead passage timing at McNary was somewhat earlier in 2002 than it was in 2001. At McNary, the wild Snake River fall chinook migration was essentially over by mid-August this year.

H. Survival Study – Comparison With 2001/I. Performance Standards. Wagner noted that the 2000 BiOp focuses on performance standards; however, he said, the bottom line is that we don't yet have all of the information we need. Wagner put up an overhead showing one survival component: in-river juveniles. For yearling chinook, the BiOp standard is 49.6%; in 2001, we saw 27.6% survival; in 2002, 52.9%. For in-river juvenile steelhead, the BiOp standard is 51.6%; last year, actual survival was only 4.2%; in 2002, 30%. The big drop-off area appears to be the reach below Lower Monumental Dam, for in-river steelhead, Wagner said. This is for Snake River fish during the spring period only? Hlebechuk asked. Correct, Wagner replied.

In response to a request, Wagner said he will send this table to Hlebechuk so she can post it to the TMT homepage. In response to another question, Wagner said one theory to explain the lower-than-expected steelhead survival is that juvenile steelhead are larger targets, and may be more susceptible to avian predation. Ruff added that 95% of the 2001 juvenile steelhead were transported; there were very few fish migrating in-river last year.

J. Weather Review. Martin began with a summary of percent-of-normal precipitation for the Columbia River above Grand Coulee, the Snake River at Ice Harbor and the Columbia at The Dalles, for the period Oct. 1 2001 through September 30, 2002. He went through 2001/2002 temperature and precipitation data by month, noting that spring featured lower-than-normal temperatures and higher-than-average precipitation, particularly in the Upper Columbia and Clearwater basins. During the summer, early-summer temperatures were higher than average, while late-summer temperatures were below normal, as was precipitation. Snow accumulation was enhanced during a flurry of late-winter and early-spring storms, which was somewhat unusual, Martin said.

Martin noted that seasonal flow augmentation was well below normal in much of Idaho and Eastern Oregon, while the Upper Columbia basin did pretty well. Overall, the water supply was about 95% of normal, which was right at my pre-season prediction, Martin said – you will recall that you laughed when I predicted 68% of normal precipitation in 2001, and we wound up with 70% of normal precipitation.

K. CRITFC Winter 2002-2003 Climate Forecast. That leads in to CRITFC's winter 2002/2003 forecast, Martin said. The bottom line is that, in my estimate, we will see 90% of normal seasonal precipitation at The Dalles, and a January-July water supply of 97 MAF, again 90% of average. The current El Niño is expected to peak in late November, and die out by May.

7. Next TMT Meeting Date.

The next meeting of the Technical Management Team was set for Wednesday, November 13 to discuss burbot operations. The next normal meeting was set for Wednesday, December 4. A conference call to discuss the status of the chum operation was set for Friday, November 8. Meeting summary prepared by Jeff Kuechle, BPA contractor.